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10/693,169	10/23/2003	Mark S. Wallace	020621	2628

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EXAMINER	
HALIYUR, VENKATESH N	

ART UNIT	PAPER NUMBER
2476	

NOTIFICATION DATE	DELIVERY MODE
12/21/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

us-docketing@qualcomm.com

Office Action Summary	Application No.	Applicant(s)	
	10/693,169	WALLACE ET AL.	
	Examiner	Art Unit	
	VENKATESH HALIYUR	2476	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42 (claims 26,28,34 are canceled)* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-24,40* is/are allowed.

6)☒ Claim(s) *25,27,29-31,35-37,41 and 42* is/are rejected.

7)☒ Claim(s) *32-33 and 38-39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 10/07/2010 has been fully considered. Rejection follows.

2. Claims 1-42 are pending in the application. Claims 26, 28, 34, are canceled.

Claim Objections

3. Claims 1, 24 are objected to because of the following informalities:

In independent claim 1, line 13: Please correct the limitation "calibrating a downlink channel and uplink channel" to "calibrating the downlink channel and uplink channel".

In independent claim 24, line 18: Please correct the limitation "means for establishes is performed" to "means for establishing is performed".

Appropriate correction is required.

Claim Rejections – 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesecher et al [US Pat: 6,278,726] and Keskitalo et al. [US Pat: 7,403,748] further in view of Hudson [US Pat: 7,254,171].

Regarding claims 25,27, Mesecher et al disclosed a user terminal in a wireless time division duplexed (TDD) communication system , comprising: a transmit (TX) spatial processor (**transmitting circuit, Figs 14-15)** operative to transmit a first pilot on an uplink channel **(col 6, lines 5-22);** a receive (RX) spatial processor operative **(receiving circuit, Fig 17)** to receive a second pilot on a downlink channel and derive an estimate of a downlink channel response based on the received second pilot **(col 6, lines 23-27)**, and to receive an estimate of an uplink channel response derived based on the transmitted first pilot **(col 6, lines 41-67, Figs 18-19)**; and a controller operative to determine first and second sets of correction factors based on the estimates of the downlink and uplink channel responses **(col 7, lines 1-15, Figs 20-21)**, wherein a calibrated downlink channel is formed by using the first set of correction factors for the downlink channel and a calibrated uplink channel is formed by using the second set of correction factors **(vector correlators)** for the uplink channel **(col 7, lines 16-31),** and to determine the first and second sets of correction factors based on a minimum mean square error computation **(MMSE, col 7, lines 32-37)**. Mesecher et al disclosed a method for spatial processing of steering pilots to calibrate uplink and downlink

channels to establish communication between the subscriber units but fails to positively disclose using spatial processors to transmit and receive pilot signals on uplink and downlink channel respectively for channel estimation. However, Keskitalo et al disclosed the feature of transmit and receive spatial processors **(transceiver, item 21 of Fig 3, col 8, lines 52-60)** to transmit and receive pilot signals for performing channel estimation on uplink and downlink channel respectively **(col 5, lines 20-67, Fig 3, items 18, 20 and 22 of Fig 3, col 8, lines 6-67, col 9, lines 1-23)**. Therefore it would have been obvious for one of the ordinary skill in the art at the time the invention was made to use the feature of spatial processors to transmit and receive pilot signals on uplink and downlink channel respectively for channel estimation as taught by Keskitalo et al in the system of Mesecher et al to include spatial processors to transmit and receive pilot signals on uplink and downlink channel respectively. However both Mesecher and Keskitalo fail to disclose wherein the controller is further operative to determine the first and second sets of correction factor based on a matrix-ratio computation to establish communication between first and second sets in a wireless communication system. However, Hudson et al in disclosed a method for the controller **(processor, item 150 of Fig 1, col 8, lines 52-60)** to determine the first and second sets of correction factor based on a matrix-ratio computation using MMSE equalized packet spectrum ratio between the first and second subscriber stations **(items 620 and 608 of Fig 6, col 10, lines 1-67, col 19, lines 17-42, Fig 6).** Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE equalized packet spectrum ratio to establish a communication between

first and second sets in a wireless communication system as taught by Hudson in the system of Mesecher et al as modified by Keskitalo to establish communication between the first and second subscriber sets in a wireless communication system without performing on calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order by applying MMSE equalized packet spectrum ratio to establish high quality communication links between first and second sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets with the access points.

6. Claims 29-31, 35-37, 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boros et al [US Pat: 6,654,590] and Nelson, Jr. et al [US Pat: 7,006,483] and further in view of Keskitalo et al. [US Pat: 7,403,748].

Regarding claim 41, Boros et al disclosed a method for communication in a wireless system **(Fig 1),** comprising: calibrating one or more communication links between a plurality of user stations **(subscriber units, items 141 of Fig 1)** and one or more access points **(base station, item 101 of Fig 1),** based on one or more sets of correction factors **(calibration vectors)** derived from estimates of channel responses associated with the one or more communication links **(col 14, lines 30-47),** the plurality of user stations including a first user station **(item 141 of Fig 1)** and a second user station **(item 143 of Fig 1, col 13, lines 47-65);** and establishing communication between the first and second user stations using steering without performing further calibration between the first and second user stations using weighted average calibration vector **(average calibration vector, col 14, lines 35-60)**; wherein

establishing the communication between the first and second user stations comprises: sending, from the first user station a pilot request to establish a communication link with the second user station **(col 12, lines 46-52)**; sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and transmitting information between the first and second user stations using steering based on the steered pilot **(using uplink and downlink spatial signatures col 20, lines 40-58, Fig 7)**. Boros et al disclosed an uplink and downlink spatial signature method (steering pilot) for calibrating and establishing communication between the subscriber units but fails to positively disclose using steering signal for calibration and establishing communication between first and second mobile stations in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber stations. However, Nelson et al disclosed a method of establishing communication between first and second mobile stations **(item 15's of Fig 1)** in a wireless communication system based on one or more sets of correction factors **(Fig 1, col 2, lines 1-25, Abstract) (performs FEC based on observed conditions, col 7, lines 1-67, col 8, lines 1-25)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of establishing communication between first and second sets in a wireless communication based on one or more sets of correction factors as taught by Nelson et al in the system of Boros et al for establishing communication between first and second sets of nodes in a wireless communication system on the transmit and receive channels of the subscriber sets. Boros et al and Nelson however fail to

positively disclose the feature that the communication between the first and second sets in a wireless communication system is maintained without performing further calibration on the transmit and receive channels of the subscriber sets. However Keskitalo et al disclosed that the communication between the mobile stations **(Figs 6/7)** can be maintained without performing further calibration on the transmit and receive channels **(col 4, lines 59-67, col 5, lines 1-67, Fig 3)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method to establish communication between first and second sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets as taught by Keskitalo in the system of Boros et al as modified by Nelson for establishing communication between the first and second subscriber sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order to establish a high quality communication links between first and second sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets with the access points.

Regarding claims 42, Boros et al disclosed an apparatus **(Fig 1)** for communication in a wireless system **(Figs 4-7),** comprising: means for calibrating one or more communication links between a plurality of user stations **(subscriber units, items 141 of Fig 1, col 13, lines 47-65)** and one or more access points **(base station, item 101 of Fig 1),** based on one or more sets of correction factors **(calibration vectors)** derived from estimates of channel responses associated with the one or more

communication links **(col 14, lines 30-47),** the plurality of user stations including a first user station **(item 141 of Fig 1)** and a second user station **(item 143 of Fig 1);** means for establishing communication between the first and second user stations using steering **(using single calibration vector, col 14, lines 35-60)**; wherein establishing the communication between the first and second user stations comprises: means for sending, from the first user station a pilot request to establish a communication link with the second user station **(col 12, lines 46-52)**; means for sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and means for transmitting information between the first and second user stations using steering based on the steered pilot **(using uplink and downlink spatial signatures col 20, lines 40-58, Fig 7** Boros et al disclosed an uplink and downlink spatial signature method (steering pilot) for calibrating and means for establishing communication between the subscriber units but fails to positively disclose using steering signal for calibration and means for establishing communication between first and second mobile stations in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber stations. However, Nelson et al disclosed a method of establishing communication between first and second mobile stations **(item 15's of Fig 1)** in a wireless communication system based on one or more sets of correction factors **(Fig 1, col 2, lines 1-25, Abstract) (performs FEC based on observed conditions, col 7, lines 1-67, col 8, lines 1-25)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the means for establishing

communication between first and second sets in a wireless communication based on one or more sets of correction factors as taught by Nelson et al in the system of Boros et al for establishing communication between first and second sets of nodes in a wireless communication system on the transmit and receive channels of the subscriber sets. Boros et al and Nelson however fail to positively disclose the feature that the communication between the first and second sets in a wireless communication system is maintained without performing further calibration on the transmit and receive channels of the subscriber sets. However Keskitalo et al disclosed that the communication between the mobile stations **(Figs 6/7)** can be maintained without performing further calibration on the transmit and receive channels **(col 4, lines 59-67, col 5, lines 1-67, Fig 3)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the means for establishing communication between first and second sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets as taught by Keskitalo in the system of Boros et al as modified by Nelson for establishing communication between the first and second subscriber sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order to provide means for establishing a high quality communication links between first and second sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets with the access points.

Regarding claim 29, Boros et al disclosed a method for communication in a wireless system **(Fig 1),** comprising wherein establishing the communication between the first and second user stations comprises: sending, from the first user station a pilot request to establish a communication link with the second user station **(col 12, lines 46-52)**; sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and transmitting information between the first and second user stations using steering based on the steered pilot **(using uplink and downlink spatial signatures col 20, lines 40-58, Fig 7)**.

Regarding claims 30-31, 36-37, Boros et al disclosed wherein the request to establish the communication comprises an identifier of a basic service set to which the first user station belongs **(quality estimates for respective subscriber units, col 31, lines 62-67, col 32, lines 1-10)** and an identifier of the first user station **(SUs, col 32, lines 20-35)** and wherein the acknowledgment comprises an identifier of the second user station, an identifier of a basic service set to which the second user station belongs, and a data rate indicator **(indicator Q, col 32, lines 36-51).**

Regarding claim 35, Boros et al disclosed an apparatus **(Fig 1)** for communication in a wireless system **(Figs 4-7),** wherein establishing the communication between the first and second user stations comprises: means for sending, from the first user station a pilot request to establish a communication link with the second user station **(col 12, lines 46-52)**; means for sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request

from first user station; and means for transmitting information between the first and second user stations using steering based on the steered pilot **(using uplink and downlink spatial signatures col 20, lines 40-58, Fig 7)**.

Allowable Subject Matter

7. Claims 1-24, 40 are allowed over prior art and objections made in this office action is overcome.

Claims 32-33, 38-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's argument, see remarks filed on 10/07/2010 with respect to rejection of claims 25, 27, 29-31, 35-37, 41-42 have been considered but is not persuasive.

With respect to applicant's argument, (see page 17 of remarks) for claims 41 and 42, the examiner has indicated the allowable subject matter of claims 32-33 and 38-39 to be combined with the independent claims respectively as claims 41 and 42 do not recite elements for direct communication between subscriber sets with calibrating uplink and downlink channels for use in peer-to-peer communications between first and

second user terminals or establishing peer-to-peer communications between the user terminals, as claimed in claims 18,24 and 40.

With respect to applicant's argument for claims 25, 27 that *Mesecher, Keskitalo* and Hudson fail to teach "using spatial processors to transmit and receive pilot signals on uplink and downlink channel respectively for channel estimation", However, the Examiner respectfully disagrees and refers applicants to Mesecher et al disclosed a method for steering pilots to calibrate uplink and downlink channels to establish communication between the subscriber units (col 6, lines 5-67, Figs 18-19) and to determine first and second sets of correction factors based on the estimates of the downlink and uplink channel responses (col 7, lines 1-15, Figs 20-21), but the examiner agrees that Mesecher fails to positively disclose using spatial processors to transmit and receive pilot signals on uplink and downlink channel respectively for channel estimation and used Keskitalo reference for the feature of using spatial processors to transmit and receive pilot signals for performing channel estimation on uplink and downlink channel respectively (col 5, lines 1-67, Fig 3, items 18, 20 and 22 of Fig 3, col 8, lines 6-67, col 9, lines 1-23). The examiner agrees that Mesecher and Keskitalo fail to disclose wherein the controller is further operative to determine the first and second sets of correction factor based on a matrix-ratio computation to establish communication between first and second sets in a wireless communication system and used Hudson reference for the method for the controller (processor, item 150 of Fig 1, col 8, lines 52-60, col 6, lines 46-67) to determine the first and second sets of correction factor based on a matrix-ratio computation using MMSE equalized packet spectrum ratio between

the first and second subscriber stations (items 620 and 608 of Fig 6, col 10, lines 1-67, col 19, lines 17-42, Fig 6). Therefore the obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications should be directed to the attention to Venkatesh Haliyur whose phone number is 571-272-8616. The examiner can normally be reached on Monday-Friday from 9:00AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached @ 571-272-3795. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (571)-272-2600 or fax to 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197(toll-free).

/Venkatesh Haliyur/

Examiner, Art Unit 2476

/Ayaz R. Sheikh/

Supervisory Patent Examiner, Art Unit 2476